Claims

1. A membrane-electrode assembly comprising:

electrodes consisting of a anode comprising a gas diffusion layer and a catalyst material-containing active layer, and an cathode comprising a diffusion layer and a catalyst material-containing active layer; and

an electrolyte membrane interposed between the anode and the cathode and comprising a catalyst material-containing active layer at one or both sides, the electrodes being hot-pressed to the electrolyte membrane, wherein the viscosity of the active layer in coating the active layer on the gas diffusion layer is in a range of 100 to 10,000 cPs.

2. The membrane-electrode assembly of Claim 1, wherein the viscosity of the active layer in coating the active layer on the gas diffusion layer is in a range of 1,000 to 10,000 cPs.

3. The membrane-electrode assembly of Claim 1, wherein the catalyst particles forming the active layer of electrode are coated with an electrolyte.

4. The membrane-electrode assembly of Claim 1, wherein the catalyst coated on a anode side-surface of the electrolyte membrane is the same as the catalyst of the active layer in the anode, and the catalyst coated on an cathode side-surface of the electrolyte membrane is the same as the catalyst of the active layer in the cathode.

5. The membrane-electrode assembly of Claim 1, wherein

the active layer on the gas diffusion layer is coated on the gas diffusion layer by a curtain coating process.

6. The membrane-electrode assembly of Claim 1, wherein the active layer on the electrolyte membrane is coated on the electrolyte membrane by a spray coating process at a viscosity of less than 10 cPs.

7. The membrane-electrode assembly of Claim 1, wherein the amount of the active layer formed on the electrolyte membrane is 1-100% by weight based on the weight of the active layer formed on the gas diffusion layer.

8. A method for producing a membrane-electrode assembly as set forth in Claims 1 to 7, the method comprising the steps of:

(a) forming a catalyst material-containing active layer on the surface of an electrolyte membrane;

(b) forming a catalyst material-containing active layer on the surface of a gas diffusion layer; and

(c) hot-pressing the gas diffusion layer to the electrolyte membrane, wherein the viscosity of the active layer, which is applied on the gas diffusion layer at the step (b), is controlled in a range of 100 to 10,000 cPs.

9. The method of Claim 8, wherein, at the step (a), catalyst ink fed by a gas pressure method is coated on the dried electrolyte membrane by a spray process.

10. The method of Claim 9, wherein, at the step (a),

the electrolyte membrane is maintained in a dried state by a thermal dryer.

11. The method of Claim 8, wherein the step (b) is performed by coating the catalyst with electrolyte powder, mixing the coated catalyst powder with a solvent so as to prepare catalyst ink, and coating the catalyst ink on the gas diffusion layer so as to form the active layer.

12. The method of Claim 8, wherein the step (a) is carried out at an operation temperature of 20-100 °C.

13. The method of Claim 8, wherein the step (c) is carried out at an operation temperature of 50-200 °C under a pressure of 5-100 kg/cm^2.

14. The method of Claim 8, wherein the step (b) further comprises performing a dry coating process to the gas diffusion layer.

15. A membrane-electrode assembly comprising an electrolyte (ionomer)-coated catalyst particles at a catalytic active layer.